

General Disclaimer

One or more of the Following Statements may affect this Document

- This document has been reproduced from the best copy furnished by the organizational source. It is being released in the interest of making available as much information as possible.
- This document may contain data, which exceeds the sheet parameters. It was furnished in this condition by the organizational source and is the best copy available.
- This document may contain tone-on-tone or color graphs, charts and/or pictures, which have been reproduced in black and white.
- This document is paginated as submitted by the original source.
- Portions of this document are not fully legible due to the historical nature of some of the material. However, it is the best reproduction available from the original submission.

I. (AlGa)As-GaAs Solar Cell

Phase II

The four (Phase II) (AlGa)As-GaAs solar cells have been fabricated and will be delivered to JPL for radiation damage testing using 1 MeV electrons. These cells were LPE grown at 700°C for 4 minutes. The junction depth is measured to be 0.3 μm using a secondary electron microscope. The objective of this phase of the program is to verify our radiation model for the shallow junction cells (0.3 μm). Some mesa diodes were also fabricated and will be irradiated along with the cells for parallel evaluations of their electrical characteristics.

II. Solar Cell Characterization

Figures 1 through 4 show the photo i-v characteristics measured at AM0 and also the dark i-v characteristics. Figures 5 through 8 show the spectral response measurements for these cells before irradiation. The performance of each cell is summarized in Table 1. All these cells have similar characteristics and with a power conversion efficiency between 15.5% to 16%.

The first batch of cells (Phase I) have been irradiated at JPL and are presently being characterized. Detailed results on these will be reported on in the next quarterly report.

N79-16366

Unclas
43626

G3/44

(NASA-CR-158090) GaAs SOLAR CELL
DEVELOPMENT Quarterly Report, 25 Oct. 1978
- 25 Jan. 1979 (Hughes Research Labs.) 18 p
HC A02/MF A01 CSCI 10A

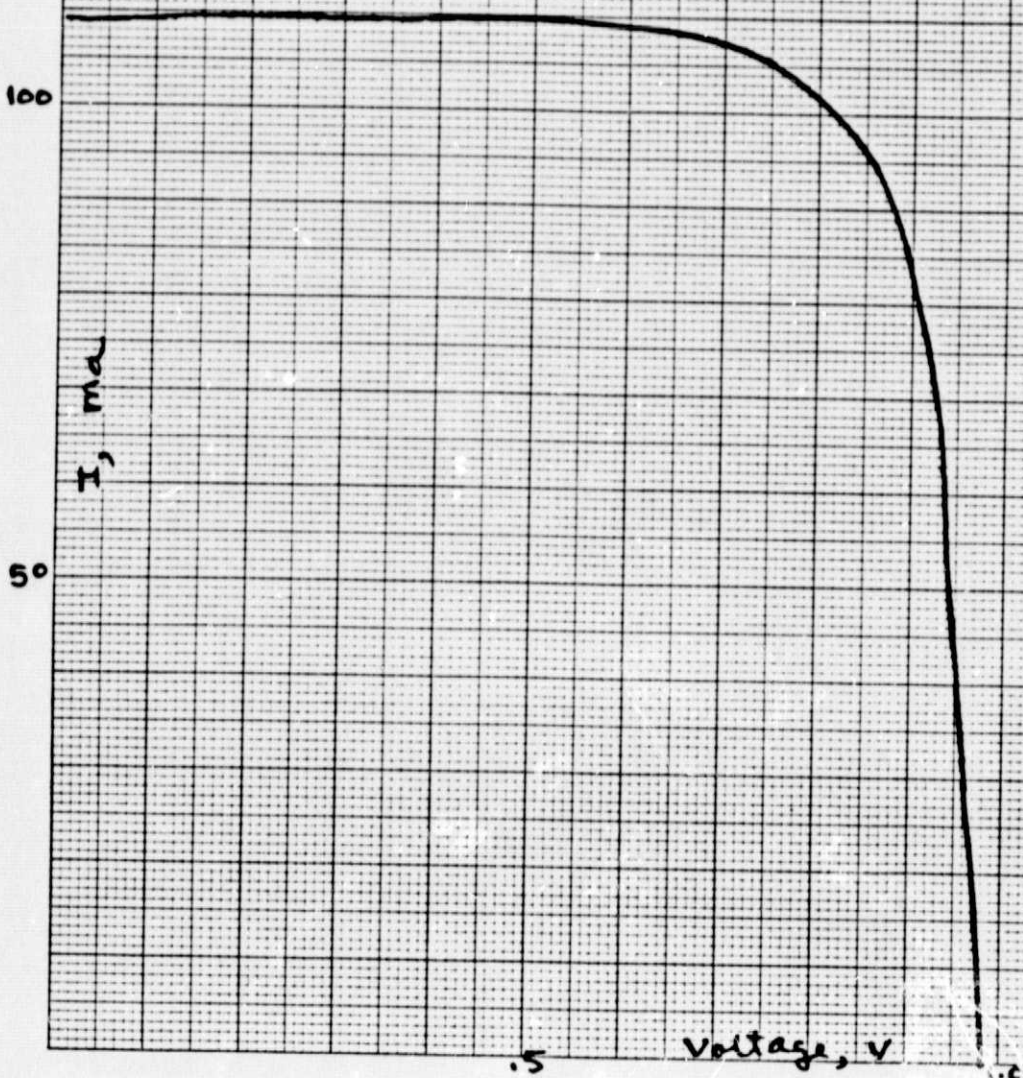
Table 1. Phase II (AlGa)As-GaAs
Solar Cell Characteristics

<u>Cell #</u>	<u>I_{sc} ma</u>	<u>V_{oc} v</u>	<u>P_{max} mw</u>	<u>FF</u>	<u>η[*] %</u>
2751	110	0.985	83.2	0.77	15.4
2752	113	1.00	85.7	0.76	15.8
2753	110	0.995	84	0.77	15.5
2756	111	1.0	86.5	0.78	16.0

Tasks for the Next Report Period

1. Testing of the first and second phase cells after irradiation.
2. Fabrication and characterization of the third phase cells.
3. Delivery of the third phase cells to JPL for electron irradiation.
4. Testing of the third phase cells after irradiation.
5. Annealing studies on the irradiated cells.

Fig. 1(a) (AlGa)As-GaAs Solar Cell photo i-v
characteristics, cell # 2751



46 1320

Fig 1(b) Dark I-V characteristics
Cell # 2751

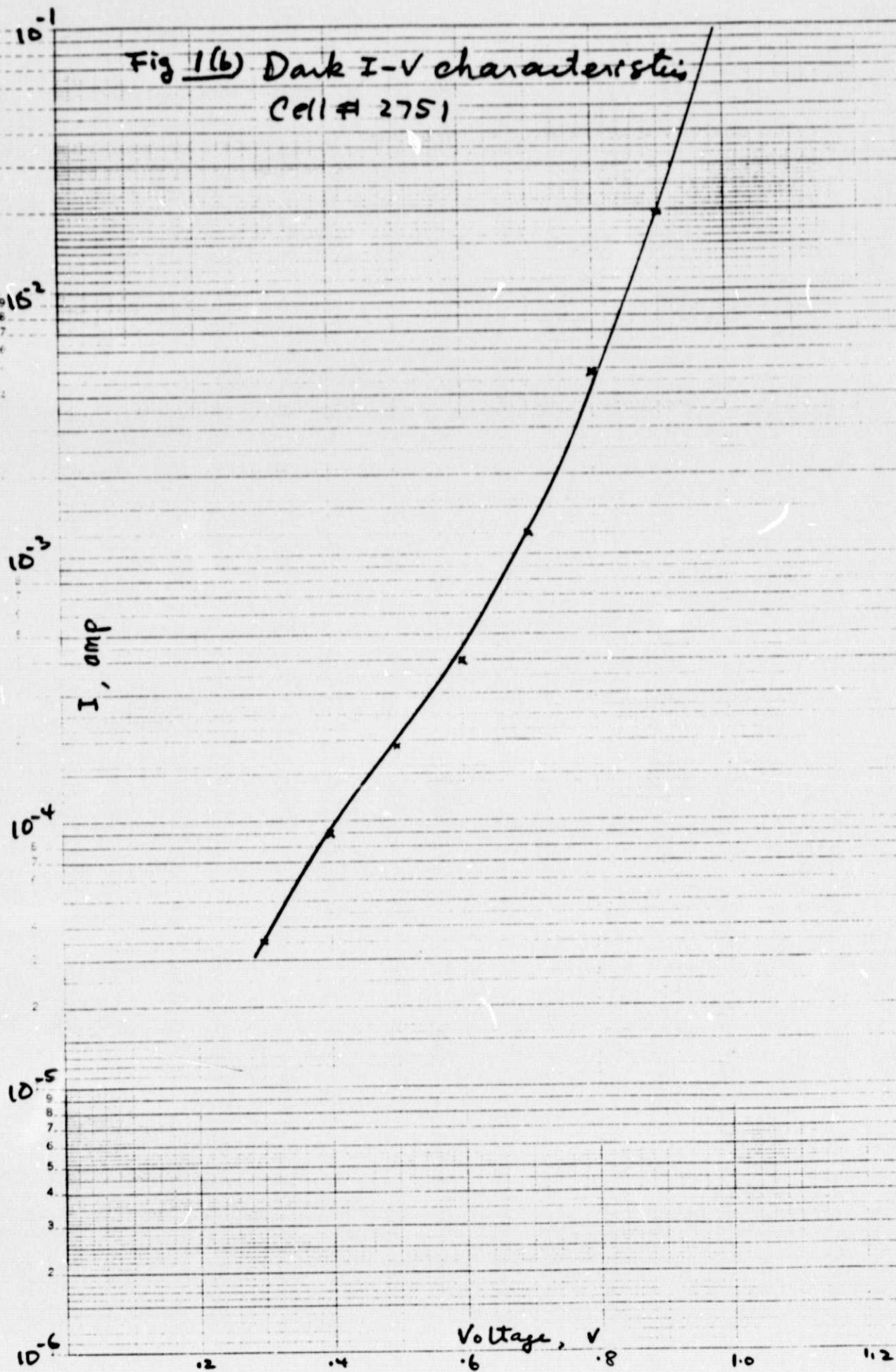
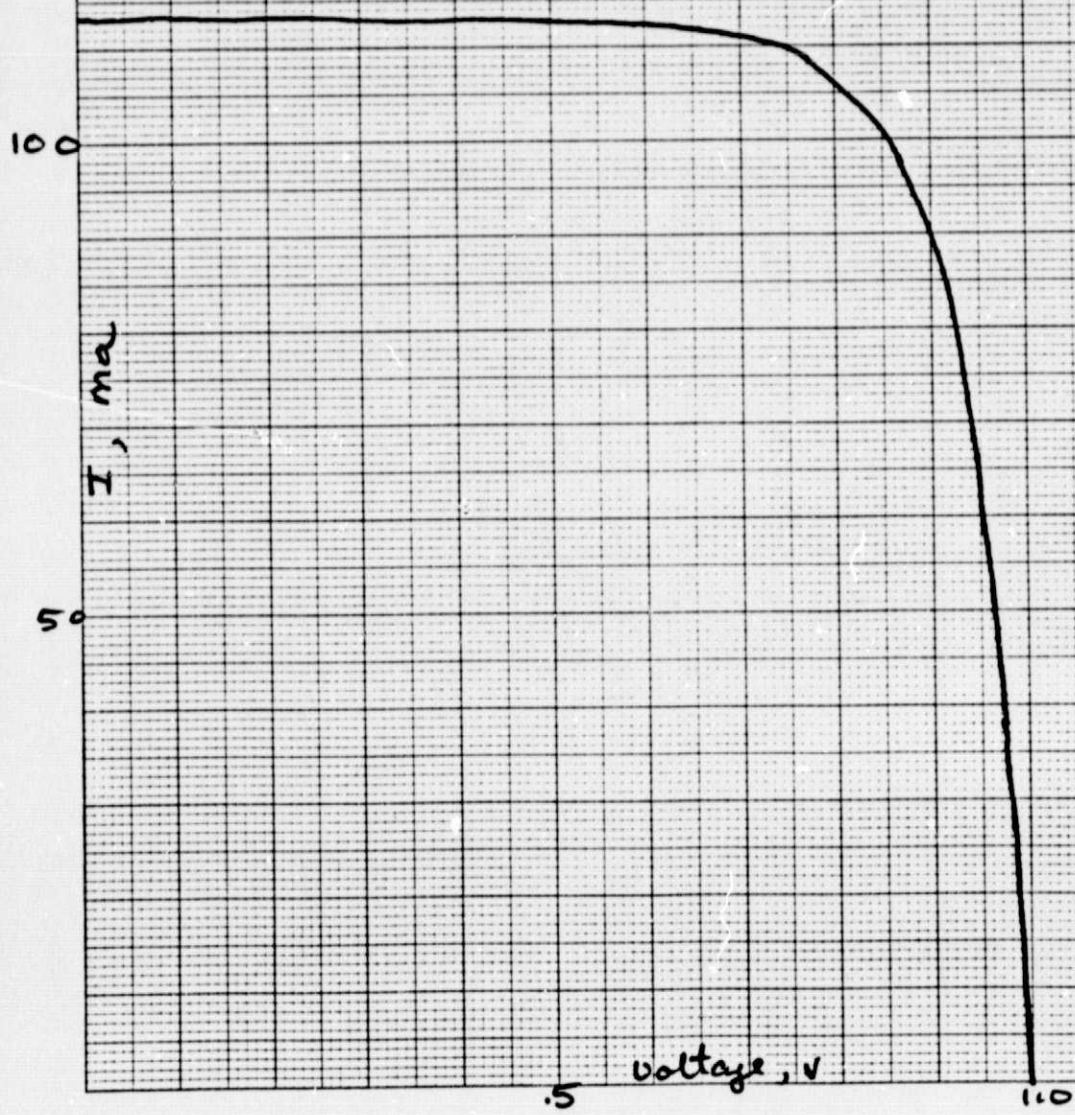


Fig 2(a) (AlGa)As-GaAs polar cell photo I-V
characteristics, cell # 2752

ORIGINAL FILED IN
OF



46 1320

K&E
10 X 10 TO 1/2 INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

Fig 2(b) Dark I-V characteristics
cell # 2752

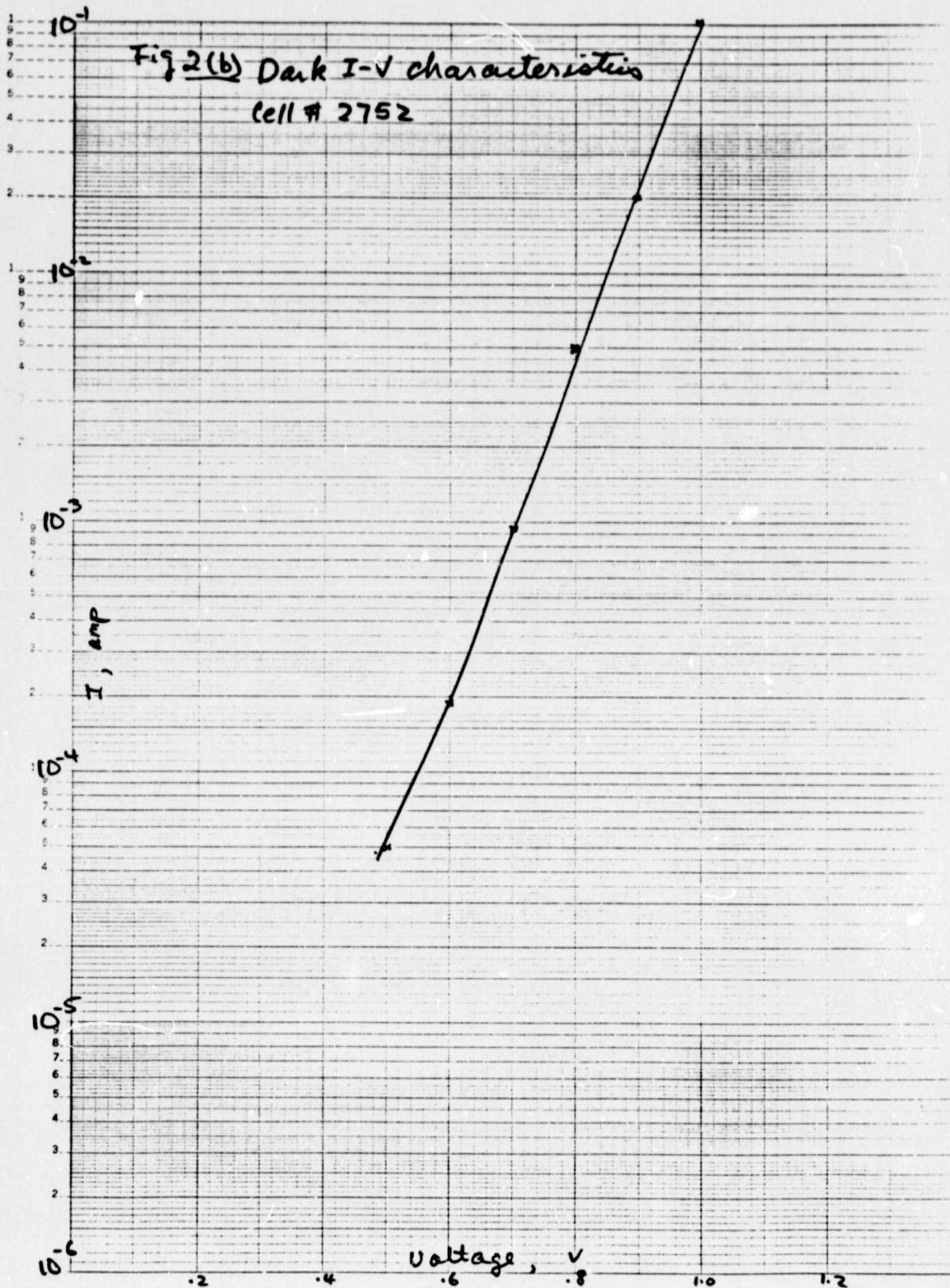
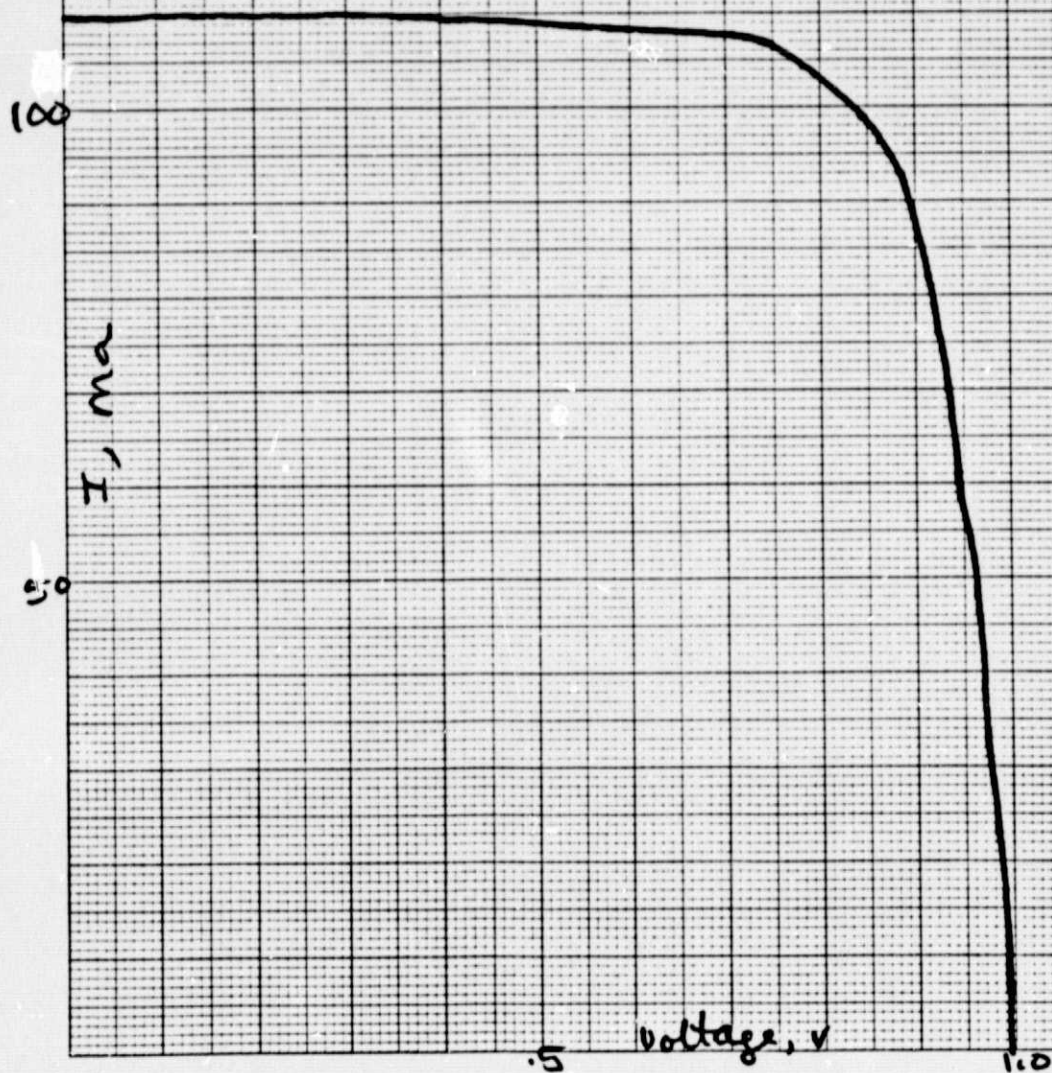


Fig 3(a) (AlGa)As - GaAs Solar cell photo
I-V characteristics cell #2573



ORIGINAL PAGE IS
OF POOR QUALITY

Fig 3 (b) Dark I-V characteristics
cell # 2753

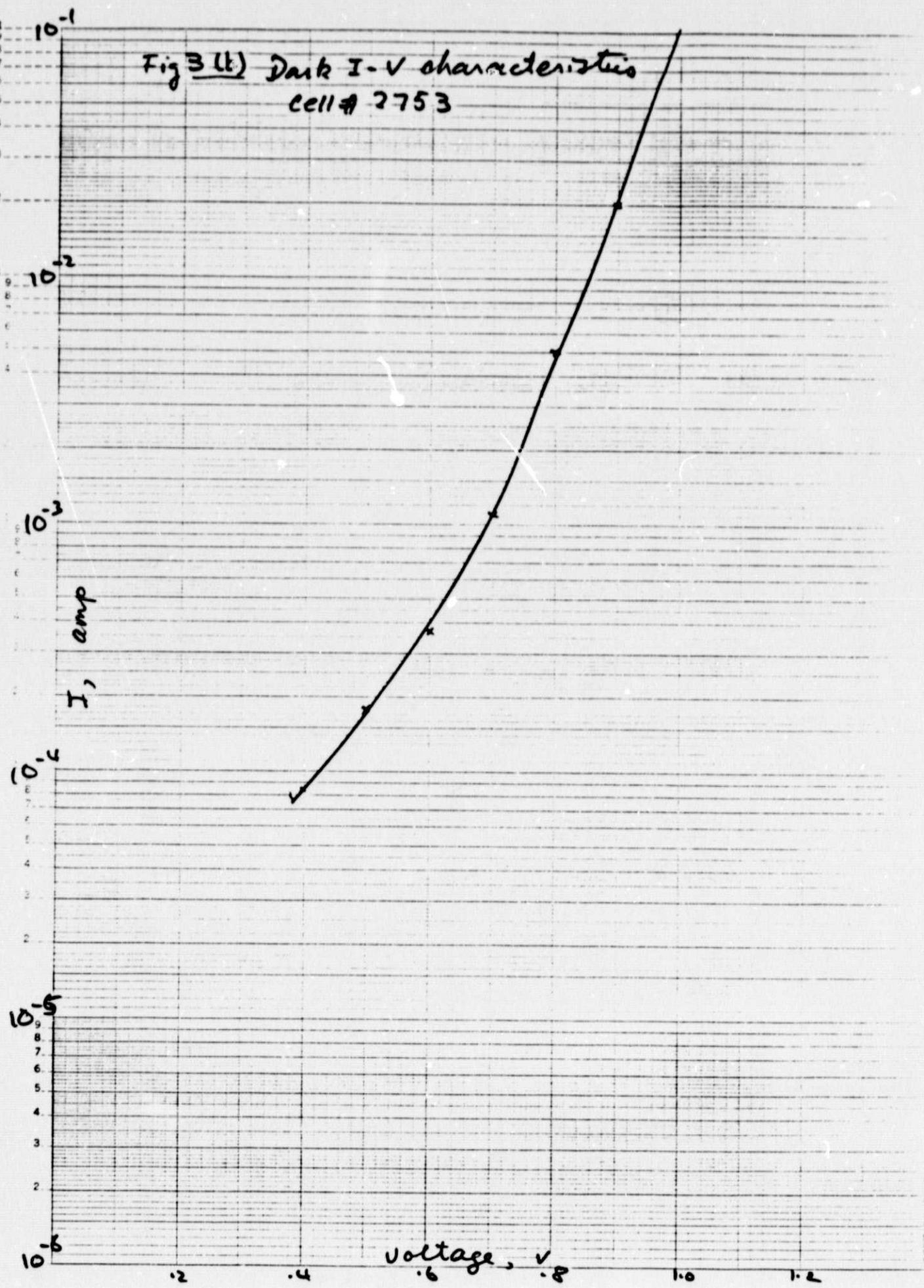
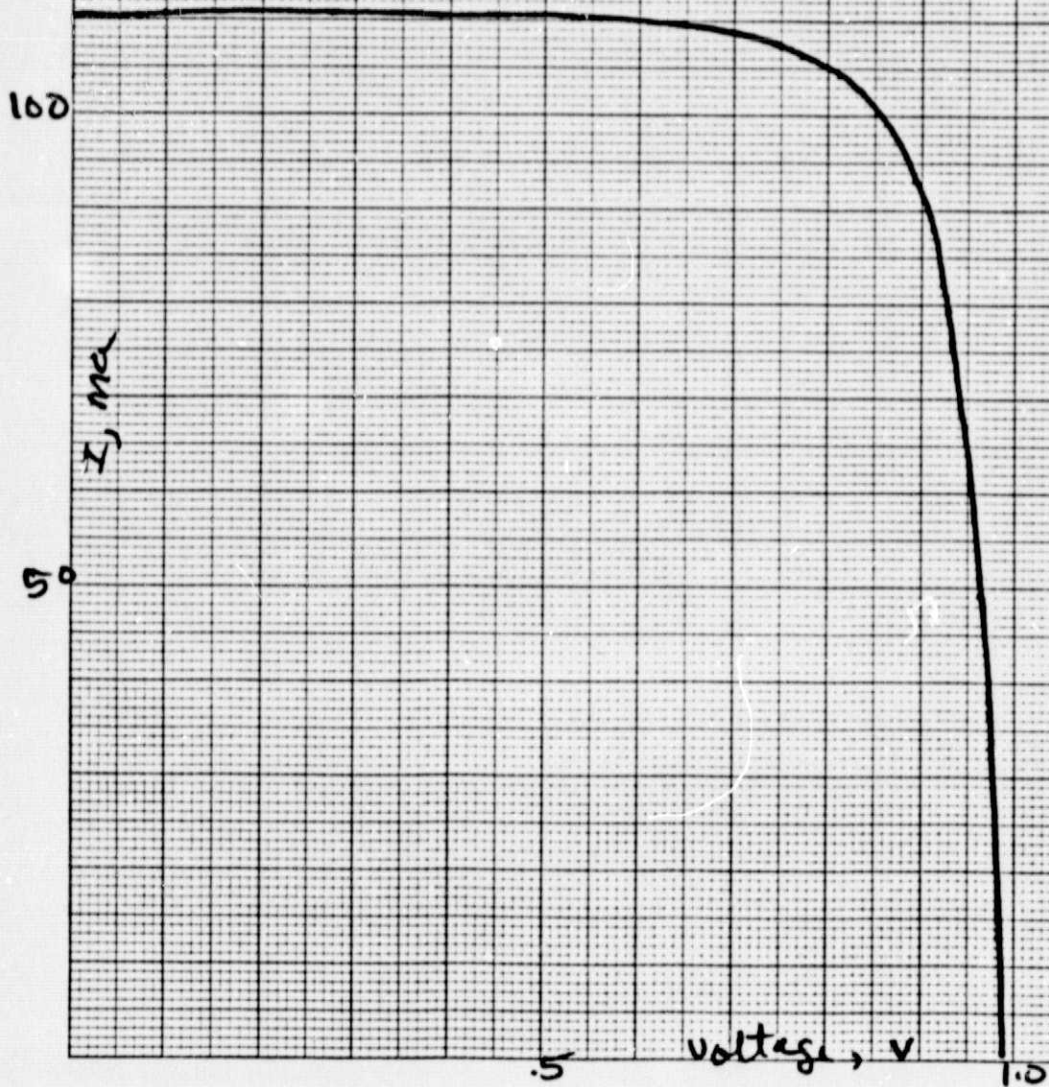


Fig 4(a) (AlGa)As - GaAs Solar cell photo
I-V characteristics cell # 2756



46 1320

Fig 4(b) Dark I-V characteristics

cell # 2756

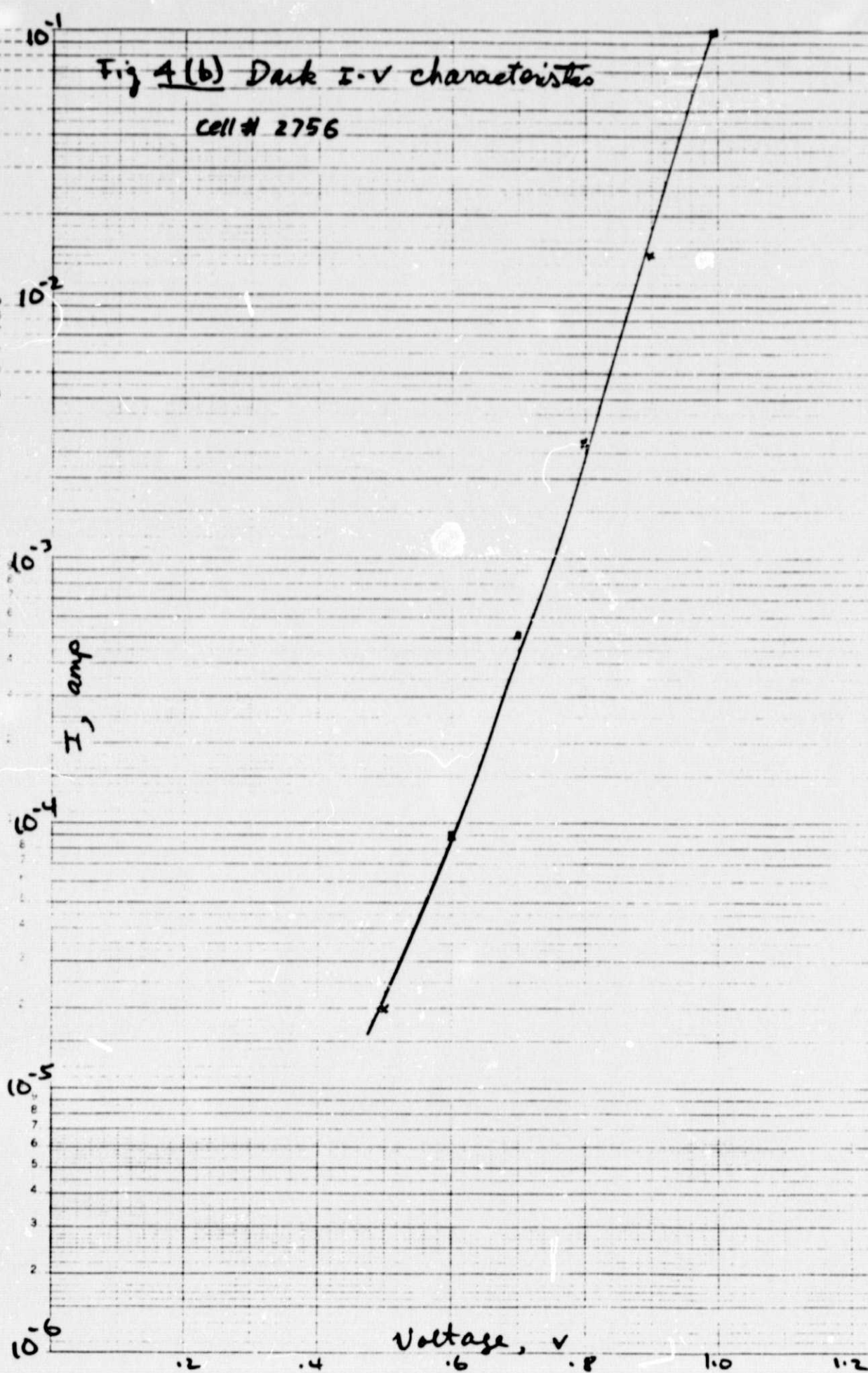


Fig 5 (AlGa)As-JeAs Solar Cell Spectral Response

Cell # 2751

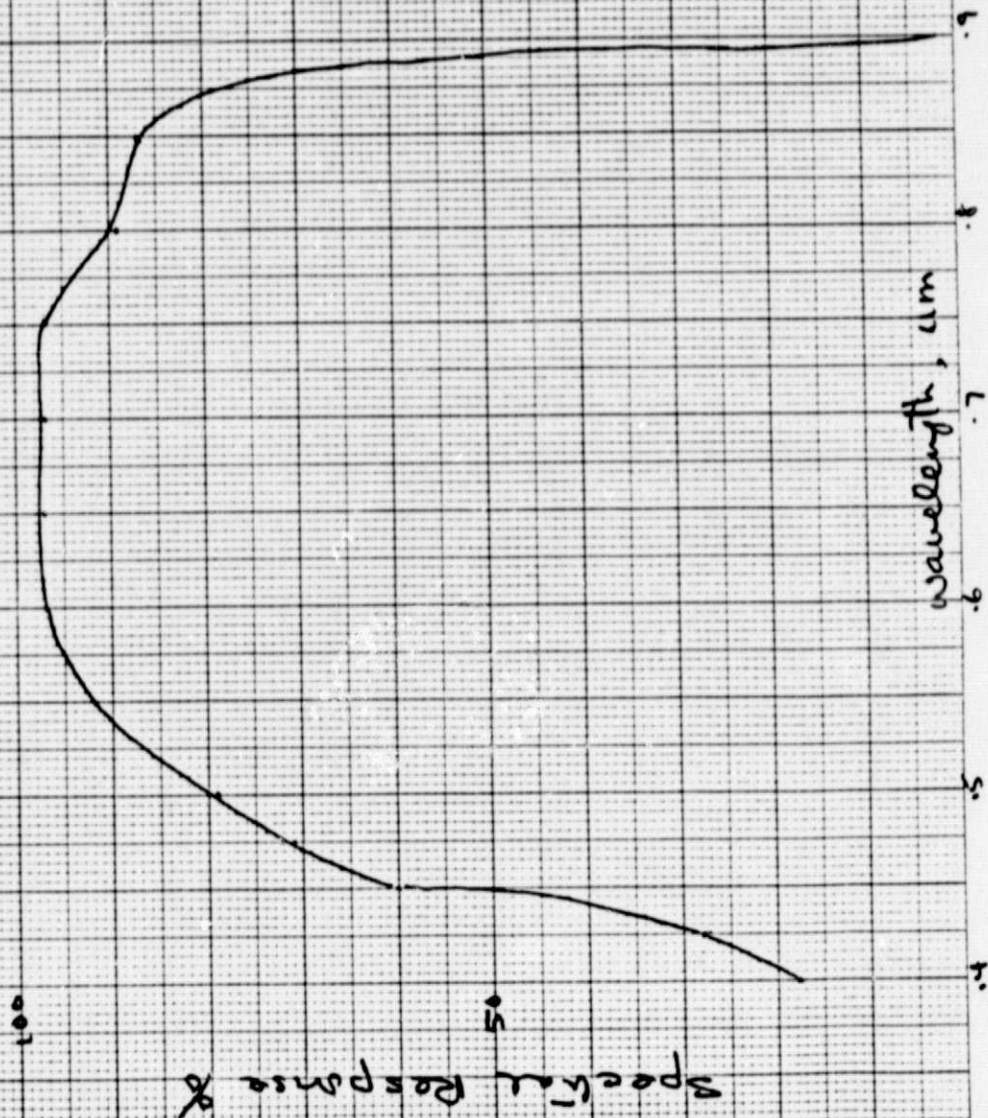


Fig 6 (AlGa)As-GeAs Solar Cell Spectral Response
cal # 2752

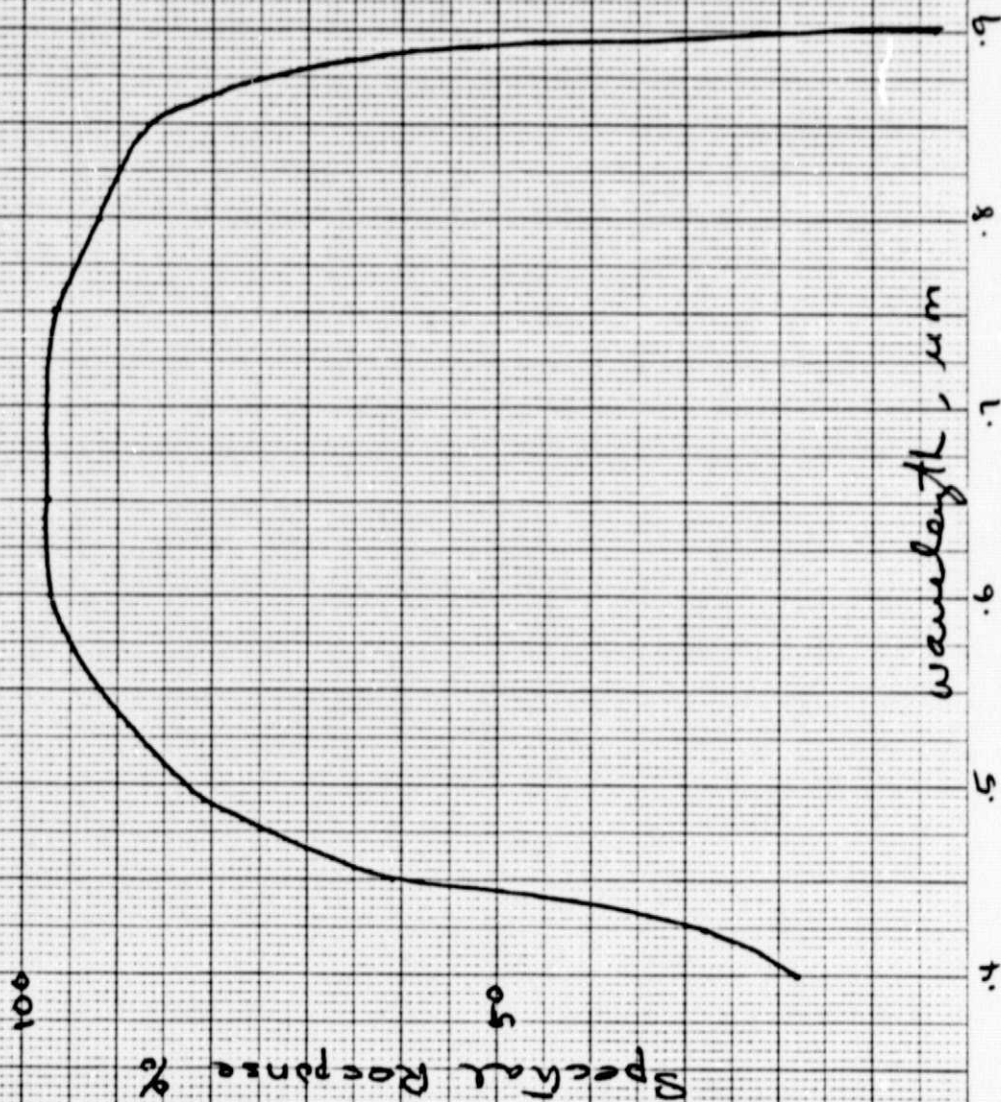


Fig 7 (AlGa)As-ZnAs Solar Cell Spectral Response
cell # 2753

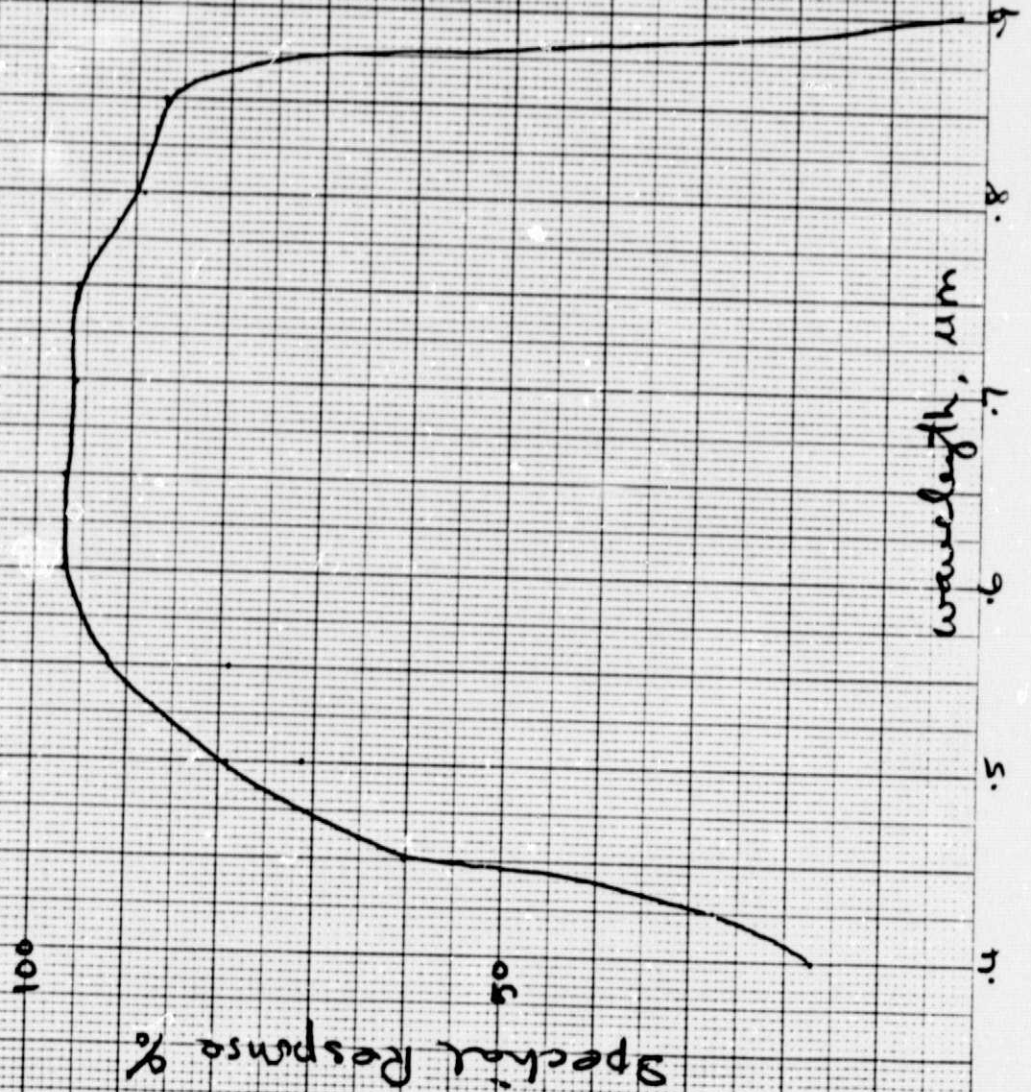
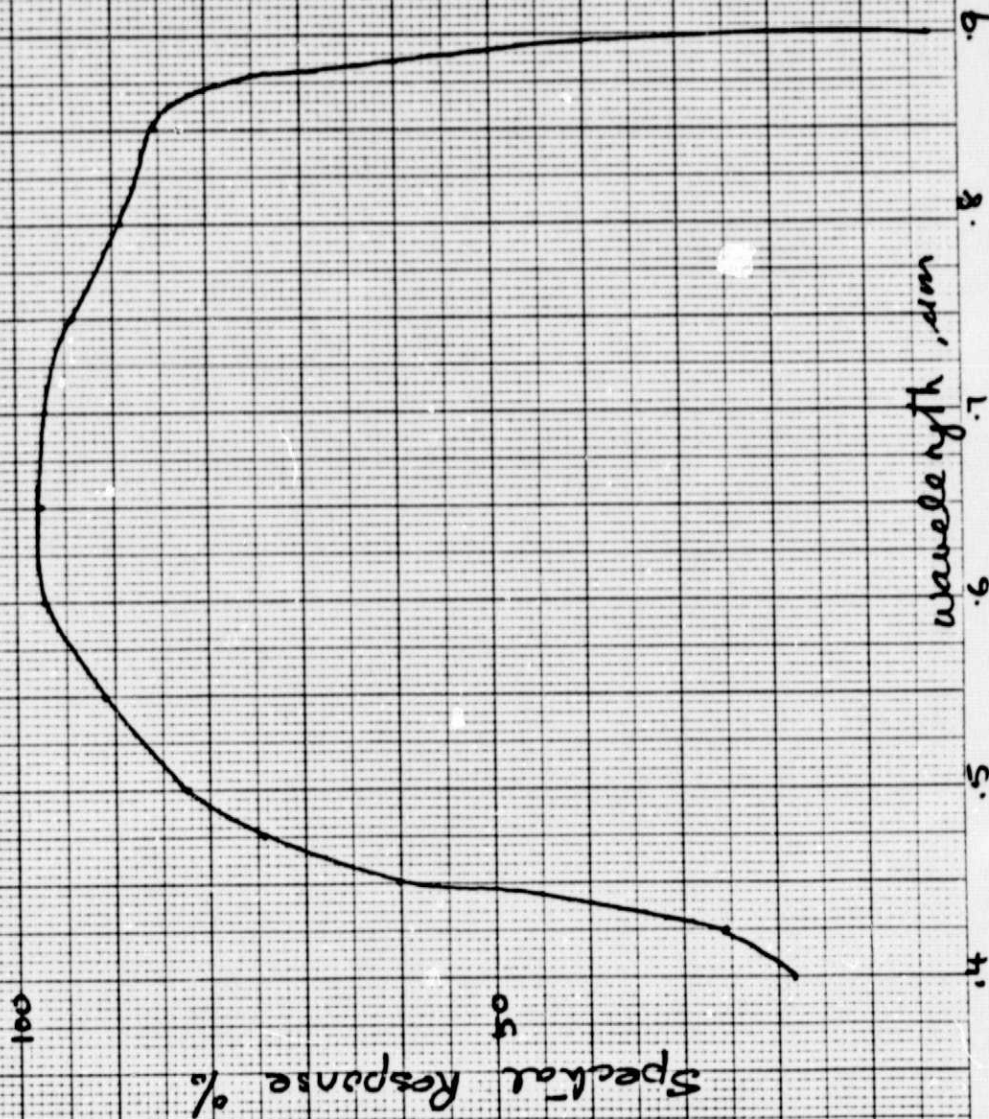


Fig. 8 (Alga)As - GaAs solar cell Spectral Response

cell # 2756



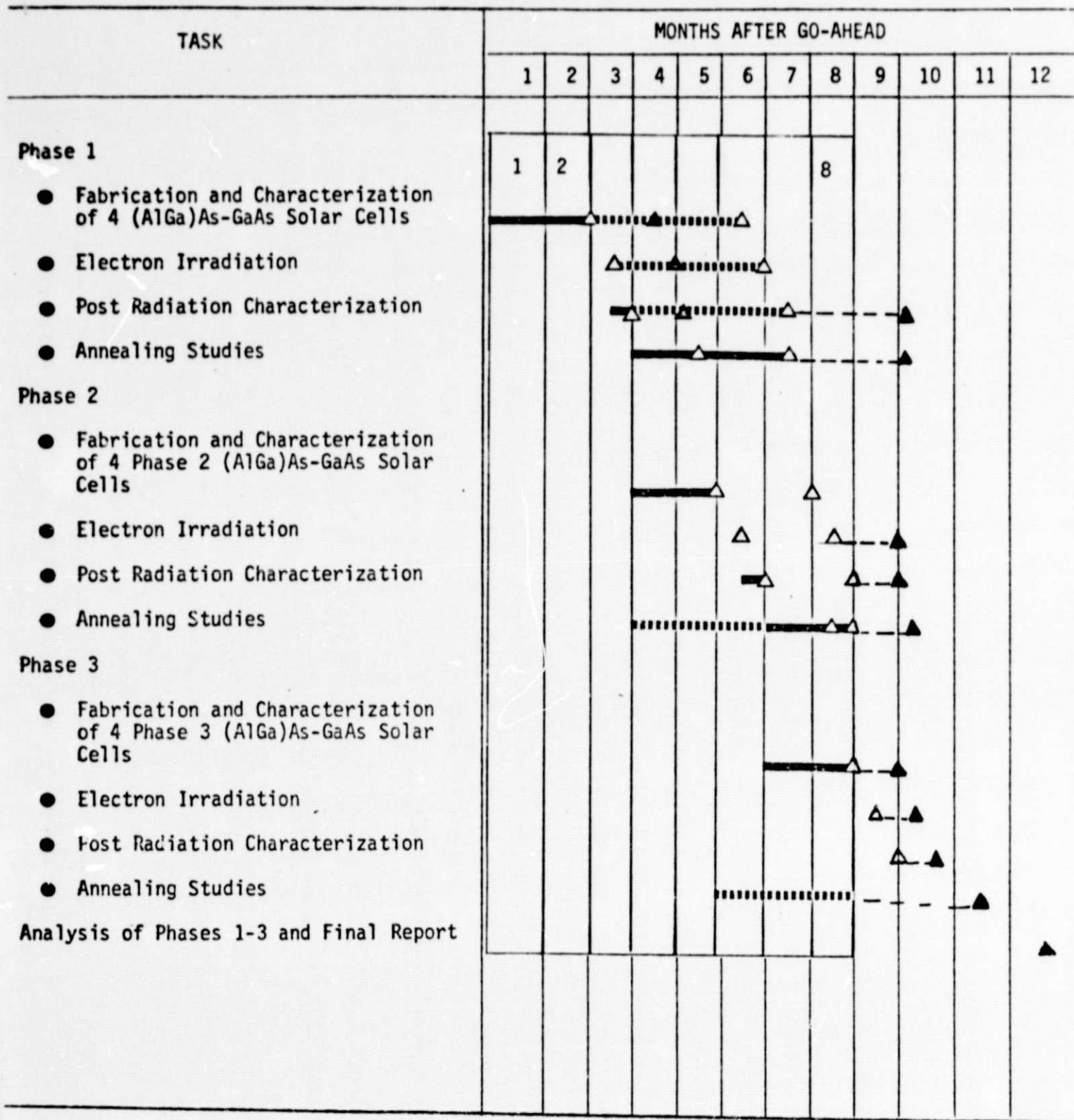


Figure 9. Program Schedule